MECHANIZING THE BUDGET

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PREFACE

The purpose of this paper is to provide an approach to the problem of formulating and executing an ever increasing Navy budget. The material is compiled in an effort to stimulate further discussion and study of automatic budget processing in the budget problem.

The chapters are intended to provide a basis for further study in the Navy budget area, and in the entire Department of Defense. This basis is founded upon a discussion of expectations, a proposed system of accounting and control, a proposed allocation program, and the application of the preceding functions to the budget cycle.

Grateful acknowledgment is made to the members of the offices of Mr. Charles H. Phillips and Mr. Harry Fellman for their efforts to produce research material and guidance. A special note of thanks should go to Mrs. Helen McNulta for her encouragement. The shortcomings are my own.

LIST OF ILLUSTRATIONS

CHAPTER I

PREPARATIONS

In preparing for such a seemingly radical change as "mechanizing" the budget, foundations must be carefully constructed.

Objectives

> It is one thing to maintain a plan for control of operations . . . but quite another to report on the validity of the objectives. . . .[1]

Any budget for executive agencies should start with a statement from the President setting forth objectives. Currently, the Navy planners produce an "educated guesstimation" of Joint Chiefs of Staff thinking and launch into planning some eighteen months prior to the fiscal year to be considered. The budget is under constant revision during the planning period. Shortening segments of this planning period is one of the aims of the proposed system.

Guidance

Budget planning is the translation of objectives into specific requirements rather than mere estimation. In this translation, true historical data have no application. Translation data must be as near to current application as possible.

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[1]James L. Pierce, "Controllership Motivation," Controller, August 1955, p. 367.

Guidance should be such that consistent planning prevails throughout the bureaus to the extent that Bureau chiefs work together with defense as a common purpose. This guidance requires single definitions of operating assumptions to enable specific guidance concepts to fan out to every operating decision during the period. Each operating program depends upon other programs and often upon other appropriations.

Good guidance under any system would force the Bureau chiefs to face difficult decisions at a time when they cannot give their unhurried attention. In the proposed system the most difficult decisions are made when a program or project first enters the system. Thereafter this program is reviewed constantly. This constant review, which is the base of trend data decisions, reduces the number of "brushfire" decisions.

The distortion of the times through tight money to easy money offers fewer unforeseen hazards. Evaluation is the key element. Through good trend data the Bureau analysts can examine both sides of the coin plus the price tag and evaluate the calculated risk. Then the Bureau chief makes his decision based on this calculated risk. Therefore good guidance leads to better accumulation of trend data which in turn leads to better decisions and again to better guidance.

Guidance should establish balance between decision and simplification. Almost anything can be measured but questions arise concerning the gains accrued. Does the end justify the means? For example, to what extent should the analyst measure budgetary minutiae? Should the measurement be

by hand or simplified through electronics? Should the person decide or should the electronic machine eject a simplified result?

People must develop along with machines and extract the ultimate services for which these machines were designed. Simplification is a service of an electronic machine. If poor guidance or lack of guidance allows the service of simplification to usurp the balance of decision, the Navy may approach a situation and time when people are no longer capable of making decisions. On the other extreme, if decision-making is encumbered by minutiae, the big game gets away.

Control

The Navy has many budgetary controls both internal and external. Internal audits and internal reviews are required by Title IV.[2] This function has been considered adequate in the Navy. Under present methods this adequacy may not survive in the foreseeable future. If inspections do not improve along with the increasing costs and complexities, lower quality will result.

Another consideration in these days of the lowered dollar values is the enforcement of a multitude of audit requirements which have emanated from the Executive Offices of the President on down through every echelon. Each Navy activity receives an audit under the direction of the Navy Comptroller each 24 months and from the General Accounting

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[2] National Security Act Amendments of 1949, Public Law 216.

Office each 36 months.

Under the proposed system, numerous audits coordinated by the Navy Comptroller could be completed faster and more thoroughly than under the present system. In addition, the records could fix responsibility for budgetary decisions. "Who" made the cut and "why" could be fixed in the record.

Another control feature of the proposed system is the selection, at will, of any individual measurement in less time than it takes to locate a group measurement under the present system.

Expenditure Limits

Expenditure limitations are exceedingly difficult to live with but are necessary and desirable from the President's point of view of balancing the budget. Since Congress is highly interested in obligations, both obligations and expenditures are under careful scrutiny and must be accountable. Further discussion of expenditure limitations will be covered later.

Motivation

People do not like budgets.[3] Budgets are too restricted. Also many people today feel that increasing attention on budget aspects may override the Navy's defense mission. A skillfully managed, constructive approach is required to gain allegiance to budget principles. Poor presentations and misuse

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[3] J. L. Pierce, "Budgets and People--A Positive Approach." Presented to the Finance Conference of the American Management Association in New York, November 20, 1953.

of the budgets leave damaging results. Many of the shortcomings attributed to the budget could be remedied by intelligent human relations. The budget problem is not simple--no more so than people--and people in Washington have become so numerous that they cannot talk to each other.

With this breakdown in communication, good budget attitudes become the criteria element. The mention of these attitudes need not alarm Navy men for they encompass nothing more than a trained disciplined approach to all programs without distrust, degenerative criticism or recrimination. Standards of performance are not new nor are the perpetual adjustments to the needs and capacities of other people. Budget attitudes thrive on such things as recognition of accomplishment, consideration of the rights of individuals, and fair play.

The budget system must be a yardstick[4] not a pointed stick; it must be a system for all to measure the amounts to be spent and the action to be taken by design rather than expediency; it must not be a system designed as a pressure device to goad people into greater efforts. To enlist all in the common effort of mileage per dollar a climate of understanding must prevail through complete explanations of objectives and methods.

Building the plan for the proposed system will consume time and dollars. However the time to the "pay off" date will

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[4] Ibid.

be inversely proportional to the effort expended on the development of people concerned with the budget. What will a new system do for these people? Will it help or hinder them in their performance? Keeping in mind that people are people all of the time and supervisors only part of the time, what will be the effect of the system on the confidence of and in those in command? How will the system effect self assurance, the ability to decide, the capacity to understand and rely on others? Few things substitute for adequate explanations.

No amount of explanations will suffice if a participating segment suffers from disorganization. A thorough management audit must be completed prior to installation of the system. If the house is not in order dissention will spread, the system will be condemned and eventually discarded.

Control and expenditure limits were discussed earlier. These elements of budgeting truly test the fibre of men. Accusations, concealments, paddings, and "end run" tales are known failings usually disguised to some degree. The disguise often includes the originator. Some mitigation can be attributed to the law of fear which pervades all public administration. A man facing an over-expenditure faces a fine of $5000 and/or a prison term of 2 years for that over-expenditure.[5] Often that man must decide between his command obligations and his personal responsibility. In addition, he must anticipate the justice he will receive in the light of the prevailing

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[5]Section 3679 the Revised Statutes as amended by Section 1211 of Public Law 759, 81st Congress.

political climate.

The budget is everybody's business and people make up the most precious resource. Changes in the working force or in the supervising force or in the reviewing force provide for wide ranges of interpretation. These changes provide an ever dynamic, constantly fluctuating budget setting. Without constant attention to people and the effects of the budget changes on them, no budget system can survive.

Steps to Success

The first step[6] toward success in establishing a "mechanized" budget is to create a genuine interest in top command people. The support from these people must be tied to EDP (electronic data processing) as a concept instead of a fascinating piece of hardware.

Secondly, the military and civilian personnel within the department must achieve an effective blend with "outside" talent. The personnel normally provided by the manufacturer have a great deal of talen to offer but they lack the specific insights available in the departmental personnel. This relationship must be realistic and workable. This feeling should extend to auditing staffs, both internal and external and to the lowest working level that will provide and receive data in the system.

The third step requires an awareness of the systems effect on people. Supervisory personnel must recognize early

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[6] D. Ronald Daniel, "EDPM--Getting Past the Barriers to Success," The Controller, December 1958, p. 572.

and act promptly on any organizational implications of EDP. If desirable behavior changes are not forthcoming, the realization of many potential advantages of EDP will be lacking.

The last major step is to anticipate the disillusionment that frequently develops. Many segments of the work load do not decrease. The savings are usually in time. Today human decisions based on human logic must be placed into the machines.

Tomorrow, machines will "think" at a rate of more than 2 million pulses per second.[7] Programming will be less flexible but automatic, offering great savings in programming time. Until tomorrow the "budgeteers" must continue to keep pace with the developments of the day or be swallowed by the works of their own hand.

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[7]George A. W. Boehm, "The Next Generation of Computers," Fortune, March 1959, p. 132.

CHAPTER II

SYSTEM

The basic system adapts a Production and Control accounting system[1] to Navy Budget accounting. The Navy's system of accounting is basically sound. With more emphasis on expenditure limitations and a tendency to increase allotments to a given activity, computer accounting adaption is now a necessity.

Estimates

Estimates are started at the lowest level of responsibility for each program management. These include:

1. Total requirement needs both for war and peace.

2. Funds and equipment now available after examining all assets.

3. A determination of how much of the deficiency should be proposed for funding in the budget year. Results are obtained from entire review procedure.

Initial planning estimates are "only the beginning." The system must provide rapid and accurate revisions whenever

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[1] IBM Accounting, "Manufacturing Control for Production Planning and Control" (Form 22-6031-2.)

there is a change in the program estimates or requirements. Some of these program changes are intermittent; others are continuous. All the programs are made up of more than one project and are chargeable to more than one appropriation.

Consolidated Program Requirements

This part of the system is based on processing a number of sets of project cards with their appropriate master program cards. Requirements for each project may be given in list form, but allotments for expenditures should be prepared from a consolidated program requirements form. This report is prepared by sorting all project requirement cards by allotment number. This procedure brings together all the requirements for a given program. These cards are then processed by the accounting machine to prepare the report.

Figure 1

CONSOLIDATED PROGRAM REQUIREMENTS FORM

Allotment Number	Allotment Description	Total Program Requirements	Requirements by Project		

Figure 2

BUREAU REQUIREMENTS SUMMARY

Allotment Number	Allotments Description	Total	FY 61 1 qtr	FY 61 2 qtr	FY 61 3 qtr	FY 61 4 qtr	FY 62 1 qtr	FY 62 2 qtr	FY 62 3 qtr	FY 62 4 qtr	FY 63

Figure 3

CONSOLIDATED REQUIREMENTS

Detail by Program

Allotment Number	Allotment Description	Program Using	Amount Required Per Program	Total

Allotment Number	Allotment Description	Support	Operating Commands (Forces Afloat)	

Storage

As the system is tested and is built to more encompassing proportions, the accounting machine procedures will be supplemented by the card programmed electronic computer.

In this application sections of the available storage capacity are preassigned to each program. Codes that govern this assignment must be punched into the project cards. If the schedule for Project A of Program 11 is assigned to section 3 of storage unit 11, all cards for this project must contain the code 11-3. Master program cards are punched for each program as before, except that the storage assignment code and an operational code must be included. These cards are fed into the accounting machine unit of the calculator and programmed to read the punched schedule dollar quantities into the designated storage unit positions. In effect, the computer has memorized a budget program of project schedules which it may consult as directed.

The process just described is somewhat oversimplified. In actual practice the storage address will consist of the last five digits of the appropriation symbol, a two-digit budget activity subhead, a bureau control number consisting of a single-digit bureau project number and a four-digit allotment number, and a three digit subauthorization number.

The operational code will consist of a three-digit object class, a five-digit expenditure account and a three-digit activity accounting number. The first identifies the item obtained and the last two identify the function served.

Commitments

Once the computer has memorized a budget program, commitments may be fed to the machine in the form of project cards coded to initiate the following program:

1. The scheduled quantity of the project on which an allotment is to be used is selected from the indicated storage location for use as a multiplier.

2. The dollar quantity per project is read from the project card for use as a multiplicand.

3. These quantities are multiplied to obtain the total dollar requirements for the project use. This total may be printed and accumulated.

Low Cost Projects

For low-cost projects, the estimate of requirements may be formed by projecting the past usage data, increased or decreased by a factor proportionate to the expected increase or decrease in total activity.

"No-Year" Appropriations

Requirements for "No-year" appropriations must be estimated over and above the usual budget year. A master schedule card may be made for each program and fiscal year with appropriate project cards as explained previously.

Figure 4

CONSOLIDATED REQUIREMENTS

"NO YEAR" APPROPRIATIONS

Allotment Number	Allotment Description	Program	FY 61	62	63	64	65	Total

CHAPTER III

ALLOCATION

The allocation process in the proposed system is controlled primarily by the preassignment of priorities to each program and each project within a program as explained in Chapter II. This process is aimed at doing whatever is to be done with the maximum efficiency. The prime "doing" in government is to control large expenditures.

Flexible Budget

Each Bureau compiles a flexible budget based on operating charges and cost,[1] by functional program and project. Expenditures are classified as fixed, variable and semi-variable based on observations of a period of experience. In actual practice a plot of these three probably would show a curvilinear pattern. However, in actual practice the budget administrators are after big game and a straight line approximation is adequate.

$$Y = A + Bx \text{ (fixed and variable)}$$

Breakeven Point

A cost of cancellation line is established from a separate list of project shut-down costs. The break-even

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[1] William J. Vatter, Managerial Accounting, Prentice-Hall 1951, p. 173.

point becomes the time when the costs of cancellation on the total of Project Shutdown Costs exceed the costs of continuing the project.

The break-even point never is considered permanent. Any effort to change the rate of expenditure or to change the rate of operating activity will affect the break-even point. Prompt cost reductions are difficult whether the needs for the commitments are real or fancied. An understanding of the break-even point not only saves the budget administrator legal embarrassments but furthers his understanding of the relationships of costs, expenditure rates and operating activity. If the expenditure rate or the activity is increased or decreased substantially he should not merely extend his curves. He should reconsider carefully item by item the effects of the nature of operations, the size and importance of the program and the change in the project requirements within each program.

Storage

The total planned costs for each program and project along with their respective break-even points are stored on tape in order of priority by program. Each project shall be weighted. If the project is indispensable to the program it will assume the same priority as its parent program. This relationship should be considered a definite and rare exception. All projects should be forced into a definite priority which forces decisions during the planning phase.

Allocation

When the apportionments are received the sum available is fed to the computer which will modify the planned project costs to agree with the sum provided. If modification of priority are required to meet the intent of Congress, this change is made before proceeding. Once the priorities are firm, the computer is "directed" to commence the allocation of funds.

The computer searches the tape from the lowest priority program to the highest and tests each project for its break-even point. This procedure continues up the project list until a test is found which is negative. The computer then returns to the lowest priority project and rejects it. The dollar amount of the rejected project will become an addition to the sum provided and all remaining project allocations are modified again to agree with this new sum provided. The search commences in the same manner as before until all projects have been tested and found satisfactory. The printer attached to the computer will prepare a list of new allotments for each project and program.

Any time the situation demands a change in priority for any or all projects this change can be made expeditiously by the use of punch cards.

All allocation information can be transmitted to bureaus and field activities through a transceiver system. Transmittal instruction information can be included in the original bureau submissions to the Navy Comptroller. This

automatic system of promulgation reduces paper work and provides prompt, unbiased, well-balanced and factual two-way reporting.[2] Work can be stopped at the most convenient and economical point of operations and the Bureaus and field activities can be informed mutually as to all costs incurred prior to the bureau's determining the action to be taken for these costs. If continued operations on specific materials or services of cancelled projects are desired, this continuing action can be determined in time to present stocking unauthorized quantities or applying unauthorized funds.

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[2]W. A. Walker and W. R. Davies, Industrial Internal Auditing (McGraw-Hill Book Company, Inc., 1951), p. 4.

CHAPTER IV

APPLICATION

The application of the proposed system follows the present development of the Navy Budget. Although this application is not mandatory, the budget administrator by using this approach reduces confusion and enhances the success of the system.

Program Objectives

The Joint Chiefs of Staff develop joint overall strategic concepts and force levels for submission to the Secretary of Defense. The Secretary of Defense issues overall policies and guidelines governing budget preparation and directs the Military Departments to prepare budgetary plans and policies. The Secretary of the Navy then outlines his policies in accordance with the instructions received from the Secretary of Defense and directs the preparation of the annual Program objectives.

This directive is scheduled for mid-December but is seldom on time and never in final static form. Budget guidance is dynamic. Manually to massage a voluminous budget to meet each of many changes in guidance is wasteful of human resources and subject to inaccuracies of human decisions. These inaccuracies are most pronounced when the decisions must be

made under pressures of inadequate time for thorough judgment and under the conflicts of responsibility related to Command functions and to budgetary functions.

The Chief of Naval Operation with the assistance of the Navy Comptroller prepares the program objectives. These programs are submitted to the Secretary of the Navy between the 10th and 21st of January. The Secretary of the Navy reviews and approves their programs about 25 January. The approved programs are forwarded about 1 February to the Navy Comptroller, the Bureaus, the Offices and the Headquarters, Marine Corps.

Preparation

The Navy Comptroller then issues a "Call for Budget Estimates" and the Bureaus prepare and revise their budget estimates for submission to the Navy Comptroller on 2 July.

During this period from 1 February to 2 July each bureau places the various projects under their management in an order of priority. This priority is assigned in accordance with the budget guidance from the Chief of Naval Operations and the Navy Comptroller; the bureaus estimate of the desires of Congress, and the bureau needs.

Review and Hearing

The Navy Comptroller reviews the Bureau estimates between 2 July and 9 July and submits a summary by cost category to the Secretary of the Navy on 10 July.

Commencing 10 July the Navy Comptroller holds hearings with the bureaus, offices and Headquarters, Marine Corps. During these hearings the Navy-wide priorities are assigned

to each project. These priorities should be fairly firm by 22 August and reduced to computer taped records.

After these initial hearings the Navy Comptroller prepares the Budget Markup and recommendations for hearings by the Chief of Naval Operations, the Navy Comptroller, the Bureaus, the Offices and Headquarters, Marine Corps. During this period of 4 September to 17 September the final differences of priority and cost are decided. These differences are placed on mark sensing cards and placed in the computer system to modify the taped records. No further modification is necessary until the President's Budget document incorporates the Navy Budget about 1 January. About 18 January the Bureaus prepare their final estimates and justifications for coordination by the Navy Comptroller and presentation to Congress. During the period--18 September to 18 January--the Bureaus can send estimated allotment information to the field. This dissemination of information is rapid, accurate and uses the same transceiver network as the rest of the system.

For example, the Bureau of Aeronautics wishes to forward estimated allotment information to a Naval Air Station at East Burning Stump, Arkansas. This Air Station is an operating part of project "Widget." Assuming an appropriation symbol[1] of 1711702, a subhead of .11, a Bureau Central Number of 31004, a SubAuthorization Number of 142, and an Activity Account Number of 164, the card address would read 11702.11

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[1] Navy Comptroller Manual, Volume 2 (with apologies to Crane, Indiana).

31004 142 000 164. The intial "17" would be omitted since it designates a Navy appropriation. The first two groups read as follows:

11702.11--Fiscal Year 1961 (1), Bureau of Aeronautics (17), special appropriation within the Bureau of Aeronautics (02) and the Budget Activity subhead (.11).

31004--project number for project "Widget" (3), allotment number (1004). Combined, these five digits make up the Bureau Control Number.

164--area number (1), activity number (64).

Note that the three-digit object class and the five-digit expenditure account number are blank at this time.

To execute this automatic dissemination, the computer is interrogated by means of a punch card. The computer system produces a deck of cards which are then fed to a sorter or an electronic statistical machine. These machines will sort the cards into stacks by geographical areas. Then each stack is fed to a card-to-card data transceiver and transmitted to the Summary Center for the respective geographical areas.

The Summary Center feeds the cards through a sorter to stack the cards by station. Each stack contains all the estimated allotments for a specific station. These stacks are fed to a card-to-card Data Transceiver and transmitted to the specific stations.

Assuming the Summarizing Center to be Memphis, Tennessee, the estimated allotment for the Naval Air Station,

East Burning Stump, Arkansas traveled from the Navy Department in Wawhington to Memphis to East Burning Stump.

In the future, the sorting may be done within the computer and the all transmitting ordered and controlled by the computer.

Allocation and Allotment

When the Appropriation Warrant has been received from the Treasury and the apportionment of funds and budget activity allocations have been approved the appropriated funds are ready for commitment, obligation and expenditure. The allocation process was discussed in Chapter III. Bureau allotments and, if necessary, sub-allotments can follow this same process. The allotment dissemination was discussed in the previous section.

Commitment, Obligation and Expenditure

When a commitment is made a portion of the allotment is reserved immediately within the computer. If this commitment is obligated in the same amount no further entries are necessary. If no obligation is forthcoming the commitment must be removed from the record and the reserved portion of the allotment made available for other purposes. These commitments are balanced as the expenditures are reported.

Reporting

The reporting network should include at least two other Summarizing Centers beside Memphis. Port Hueneme, California could receive and summarize project allotment expenditures for the West Coast areas and Patuxent River,

Maryland could do the same for East Coast areas. Only the summaries would be forwarded to the Bureaus. The forwarding can be achieved automatically through the same computer-transceiver system over which the field activities received their allotments.

East Burning Stump Naval Air Station makes an expenditure. The report would be transmitted to the Memphis Summarizing Center with the card addressed 11702.11 31004 142 099 44821 164. The first three groups were explained in the Review and Hearing section. The 09 in the fourth group identifies the Object Class of the item procured and the third digit "9" shows that this procured equipment is of a nature that is not identified by a more specific classification under the Object Class. In the fifth group the 44 indicates an operating account of a shore activity. More specifically, the first 4 denotes "Naval Activities and Offices"; the second, "Plant Maintenance, Upkeep, Repairs." The third number, 8, denotes Public Works Shops. The 2 shows that the procured item was used in the utilities shops and the 1 indicates the expenditure was charged to overhead. The last group is the activity account number. When the Memphis Summarizing Center forwards the information to the Bureaus the Object Class will be blank, the Activity Accounting Number will be 100 indicating an area report and the Expenditure Account Number will be 44000 indicating a summarization of all plant maintenance, upkeep and repair for all naval activities and offices in the area.

The same automatic summarization and transmittal can be made at the Bureau level for reporting to the Navy

Comptroller. If detailed reports are desired the printer of any computer can produce these reports rapidly at the designated time intervals. If these detailed reports are given a priority over routine transceiver traffic they may be sent by this means. This decentralization of detailed accounting eliminates many routine reports that are beyond the digestive ability of the Navy Department. If information is needed to answer Congressional questions, any point in the network can be interrogated to obtain this information. This interrogation can be done with a punch card fed to the computer in a fully automatic system or to the card-to-card Data Transceiver in the semi-automatic system. The Data Transceiver also has a voice transmission feature that may be used for this purpose.

In like manner sample audits may be made at any time anywhere in the system. These audits are restricted only by the amount and type of information available to the computer being interrogated. The classification of audit items could be as follows:[2]

a. Status of allotments

b. Summary of net disbursements and collections

c. Monthly disbursing officer recapitulations

d. Transactions for the local installation

e. Transactions by others

f. Unobligated totals.

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[2] IBM 305 RAMAC.

This network can be connected by telephone or by telegraph. Examples are the Navy's supply network and personnel network. The Air Force also has a huge network in the United States and Europe. Multiple frequencies may utilize a single land line and multiple land lines could be employed from dispersed areas as the system expands. Transceiver systems from forces afloat send logistic requirements today. This type of system could send expenditure and forecast information just as easily. Once the people develop and keep pace with the technology, the supply, the personnel, and the budget will be combined into one electronic computer communication system.

CHAPTER V

CONCLUSION

An electronic data processing computer system will provide better foundations for establishing clearer objectives and, through more informed decisions, can provide better guidance. Such a system enforces greater unity of effort among the Bureaus, enforces early decisions and provides a better base for estimations.

The government has been accentuating the need for more accounting. This system will answer many of the problems of increasing number of accounts. In particular, more adequate cost controls are available to meet expenditure limitations. This increased control is made possible in part by tying together budget funding, expenditure funding and intraservice and interservice cross funding.

The criteria element in the success of this system is people. People must be developed with the technology and people must be considered in making the decisions if the system is to be successful. These people include the American public, Congressmen, others such as agency personnel, Navy personnel, commercial people and the people of other nations.

Without attention to people, initially and continuously thereafter, the system will not survive.

The system that has been presented is an approach to a very dynamic and complex problem. Disillusionments will occur inversely with the state of good communications. Because of the complexity and enormity of the problem some disillusionment must be expected. The success of the system depends upon the recognition of this disillusionment expectancy and keeping both the illusions and disillusions within healthy limits.

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